

Avian Blood Collection Techniques

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- 1. Calculate the maximum blood volume you may collect from the avian patient.**
General rule of thumb indicates this to be no more than 1% of total body weight (or approximately 10% of blood volume in a normal bird).
- 2. Select the appropriate blood collection tools.**
A 22-27gauge needle is appropriate for most avian patients. Although the smaller needle size (e.g. 27-gauge) may be used to reduce trauma, it also increases the risk of hemolysis. The syringe used should not be rinsed with anti-coagulant, as this will introduce dilution errors in the sample.
A micro- blood collection tube with anticoagulant should be used to preserve the collected sample. Lithium Heparin (green top) is the anticoagulant of choice for chemistry analysis. Potassium EDTA (purple top) is the anticoagulant of choice for hematological analysis. In reality however, the Lithium Heparin tube is satisfactory for both chemistry and hematology. K-EDTA tubes however should never be used for chemistry analysis (results in falsely elevated potassium/false depressed calcium). A microscope slide/s should be available for immediate preparation of a blood smear.
- 3. Select site for phlebotomy.**
Jugular: the right jugular is the largest and by far the most preferred site for avian blood collection. It is easily visualized by applying a small amount of alcohol to the featherless tract on the right side of the neck. The vein should be occluded with a thumb or forefinger at the level of the thoracic inlet prior to venipuncture.
Basilic: this wing vein is located over the medial surface of the proximal ulna, and may be convenient in some species. It is however, much more prone to hematoma requiring application of pressure upon removal of the needle. I recommend avoiding it.
Metatarsal: this vein is located above the tarsometatarsal joint (hock) on the median side of the leg and may be preferred for pigeons, chickens and ducks.
Toenail Clip: this is the least preferred method of blood collection due to the probability of introducing artifacts into the sample. When used, the toenail must be thoroughly cleaned with alcohol and dried prior to collection. A very sharp and properly functioning clipper should be used with the free-flowing blood collected into the appropriate tube. Ferric subsulfate or silver nitrate may be used for post-sample hemostasis.
- 4. Prepare the patient for phlebotomy.**
Restrain the bird, optimally utilizing a clean towel. Avoid restricting patient breathing and overheating.
Fractious patient and/or inexperienced clinicians may indicate isoflurane sedation of the avian patient prior to blood collection.
- 5. Collect no more than 1% of body weight in blood volume of healthy avian patients-*less with illness.***
Prepare collection site by cleaning with alcohol. If collecting from the jugular, be sure to occlude the vein with a thumb or forefinger at the level of the thoracic inlet prior to venipuncture.
Needle may be inserted bevel-up or bevel-down, depending on operator comfort. I find the bevel down insertion method highly preferable as it allows for gentle tenting of the vein and rapid collection.
The syringe should not contain an anticoagulant due to resultant deleterious dilution effects of the sample.

6. **Transfer blood from the syringe appropriately.**

Remove the needle from the syringe prior to transfer to avoid hemolysis resulting from forced expulsion back through the needle. If a tuberculin syringe with a permanent needle is used, a Rescoe nail trimmer can be used to cut off the needle end of the syringe before the blood is transferred to transport containers.

Ideally, prepare 2 blood smears directly from the syringe, immediately after blood collection. These slides can be used for leukocyte differential and morphological examination as well as manual cell counts. If collection was delayed for any reason, immediately transfer the blood into the appropriate tube.

Transfer blood to a Lithium Heparin microtainer tube (green top). The tube should be filled a minimum of half-full to avoid significant dilution effects. This tube may be used for chemistry analysis as whole blood or plasma.

NOTE: Li-Hep anticoagulated samples will yield more plasma from the same volume of whole blood than if the sample was allowed to clot and serum is separated.

Additional blood may be transferred to a Potassium EDTA microtainer tube for hematological analysis. This purple-top tube should not be used for chemistry analysis as the anticoagulant will falsely elevate potassium and falsely depress calcium values.

Sample Quality Issues & Effects

Hemolysis:

Most hemolysis can be avoided with good collection technique and removal of the needle from the syringe prior to transferring blood into collection tubes.

Hemolysis can effect a number of test values including:

Potassium	(falsely elevated)
Phosphorus	(falsely elevated)
Bile Acids	(falsely elevated)
CK	(falsely elevated)
ALP	(falsely elevated)

Lipemia:

Postprandial lipemia is relatively rare in the avian patient, and as such is more often associated with the female reproductive cycle, anorexia, or a hepatic disorder.

Lipemia can affect a number of test values including:

Bile Acids	(falsely elevated)
Calcium	(falsely elevated)
Phosphorus	(falsely elevated)
Uric Acid	(falsely elevated)
Total solids	(falsely elevated)

Artifacts- Contamination:

Artifacts such as tissue, debris and bacteria can be minimized, or eliminated altogether with proper technique. Toenail clip is the least desirable method of blood collection due to the high probability of introducing artifacts into the sample.